

# REPORT DOCUMENTATION PAGE

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2. REPORT DATE

3. REPORT TYPE AND DATES COVERED

FINAL REPORT 01 Nov 93 - 31 Jan 95

4. TITLE AND SUBTITLE

(HBCU/MI) ADVANCEMENT OF KNOXVILLE COLLEGE RESEARCH ABILITIES

5. FUNDING NUMBERS

~~XXXXXX~~

62228D

4276/AS

6. AUTHOR(S)

Professor Nouredine

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Knoxville College  
901 College Street  
Knoxville, TN 37921

8. PERFORMING ORGANIZATION REPORT NUMBER

AFOSR-IR-95-0452

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

AFOSR/NE  
110 Duncan Avenue Suite B115  
Bolling AFB DC 20332-0001

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

F49620-93-1-0622

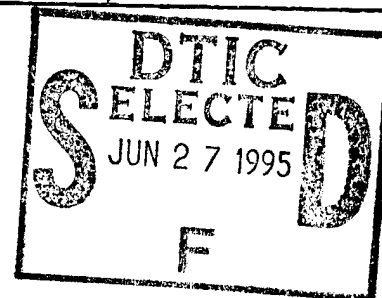
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13. ABSTRACT (Maximum 200 words)

SEE FINAL REPORT ABSTRACT



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UNCLASSIFIED

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UNCLASSIFIED

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Standard Form 298 (Rev. 2-89)  
Prescribed by ANSI Std. Z39-18  
298-102

Final Report  
On  
Research Instrumentation  
by  
G.M. Pathan and M. Rader

Accession For		
NTIS	CRA&I	<input checked="checked" type="checkbox"/>
DTIC	TAB	<input type="checkbox"/>
Unannounced		<input type="checkbox"/>
Justification .....		
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Availability Codes		
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## **Introduction:**

The purpose of this grant was two fold. The first purpose was to bring Internet capabilities to the Knoxville College campus for purposes of performing computational AFOSR research. The second purpose was to bring advanced UNIX computing capabilities to the campus and link them with similar capabilities at the University of Tennessee, Knoxville using the Internet.

It was decided to accomplish this task by purchasing portions of the equipment, software, and equipment through the University of Tennessee. This purchasing of these services through UTK resulted in a 43% discount from Sun Microsystems. This also allowed us to use all of the UTK site licenses for network services.

As specified in the initial grant, ten Sun Workstations were purchased 3 Sparcstation 10's and 7 Sparcstation LX's with the associated support equipment. In addition, 7 IBM compatibles were purchased for the Division of Natural Science, 1 Tektronix color laser printer, and 1 CD-ROM maker along with additional software to network these machines to the Sparcstation network.

## **Networking Strategy**

In order to make the maximum use of the equipment for research, 2 of the Sparcstation 10's were designated for server applications. One is on permanent loan to the University of Tennessee to act as software license, and Usenet News server for the College with the second on site to act as local server for disk, networking, and print services. The third acts as backup server at Knoxville College and master research terminal. The 7 Sparcstation LX's are being used for student based research and faculty Internet access. Name and Gateway services are being provided by a Sparcstation 5 purchased by MIS funds from the College. A detailed bid sheet from Sun Microsystems is included in Appendix A.

All of the machines purchased have been interconnected using standard TCP/IP protocols. At present the College has wired McKee Hall, Wallace Hall, and the Student Center for Internet Services from internal College funds. Access to both laser and color print services are available from all of the Sparcstations. These machines are cross linked with counterparts on The University of Tennessee campus. At present the Knoxville College mounts and has access to all of the UTK

forest domain drives through the machine stationed on the UTK campus with no reverse access set up. This increases the storage capacity of Knoxville College while maintaining the Colleges independence.

#### **Software Purchased:**

Care was taken to select multipurpose software for the systems that would allow general purpose use with special purpose software to be supplied by future research grants. More specifically Autocad R12, Matlab R4.2, WordPerfect 5.1, and various SUN compilers were purchased for the Sparcs. Portions of the software were purchased through The University of Tennessee. The major software purchased through UT include the compilers and SUN OS for \$125.00 with constant upgrades for the next two years and Matlab for \$50.00/key-year for 10 keys. Matlab was used to replace the Mathematica package due to the less expensive price.

The OS on these systems has been upgraded twice by UT since the projects inception. Once from SUN OS 4.1.3 to Solarius 2.3, and a upgrade from Solarius 2.3 to 2.4.

#### **Research Started Since Grant Inception:**

Using this equipment, two funded research projects have been started and others have been proposed to assorted DoD agencies. The first project with AFOSR entitled "The Study of Efficient Plasma Sources" is both to model and experimentally study plasma sources with the University of Tennessee. This project is divided into two parts. The first part, being performed at Knoxville College, is to computationally model various plasma sources and then experimentally produce the same source at the University of Tennessee plasma science facility. This project has since then been modified, with the consent of the contract monitor to include work by Knoxville College on the AFOSR OOPIC code.

In conjunction with the work already started, a second project has been funded by the Office of Navel Research to link student laboratories at Knoxville College with the University of Tennessee. This will serve as a transitioning lab between Knoxville College and UTK. This will allow students to get training in elementary engineering courses at KC then transition to UTK for a full

engineering degree as well as get a second degree from Knoxville College.

### **Equipment Purchased From Cost Savings:**

Because of the cost savings afforded to the joint KC-UTK work, excess uncommitted funds were remaining at the end of the contract period. Since part of the focus of the original research grant was shifted to include work on the IBM P.C. compatibles, it was decided to use part of the excess funds to purchase 9 IBM compatibles. Five 486-50's were purchased as student research machines along with 2 486-66's.

In addition two lap top computers have been ordered. One is a color 486-50 from Gateway 2000, with the second being a color 486-100 from the same company. Also included in the cost savings are 1 Tektronix IISX 300 dpi color laser printer, 1 Macintosh Quadra 840AV, and 1 CD-ROM maker. As of the writing of this report the IBM P.C.'s have been ordered, but have not been delivered. Delivery is expected in late April.

### **Conclusion:**

All of the equipment specified in the original grant was purchased in accordance with AFOSR guidelines along with the technical support needed to install and maintain the equipment. In addition, with AFOSR permission, additional equipment was purchased through the grant from cost savings on the original quoted prices. These cost savings were achieved by the purchase of the Sun computer equipment through the University of Tennessee. This use of large state institution buying power resulted in the purchase of 11 additional computers, one CD-ROM maker, and one color laser printer.

**Appendix A**  
**Sun Microsystem Bids**

# THE UNIVERSITY OF TENNESSEE

PAGE 1

PURCHASING DEPARTMENT  
2200 ANDY HOLT AVENUE  
KNOXVILLE TN 37996 5000  
615-974-3311

REQUEST FOR QUOTATION

NUMBER EC-E00121

DATE 01/24/94

RETURN QUOTATION  
BY DATE SHOWN

DUE DATE 02/09/94 10:45 ET

**THIS  
IS  
NOT  
AN  
ORDER**

ATTN: JANINE YOUNG

BUYER R. C. BOLLING

Bidder

SUN MICROSYSTEMS INC  
725 PELLISSIPPI PKWY, STE 205  
KNOXVILLE TN 37922

24719N Bidder

SHIPMENT  
PROMISED

15-30 Days ARO

PLEASE

TERMS

INSERT

Net 30 Days

F.O.B.

UTK-DEST

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
001	3	EA	ITEMS AS LISTED BELOW TO BE SUN PER THE ATTACHED SPECIFICATIONS OR EQUAL. S10FGX-40-32-P46 SPARCSYSTEM 10 MODEL 40 WITH ONE SUPERSPARC PROCESSOR GX 8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION 16-INCH COLOR MONITOR, 32-MBYTE 1.05-GBYTE INTERNAL FAST SCSI-2 DISK, SPEAKERBOX, 1.44-MBYTE 3.5-INCH INTERNAL FLOPPY DRIVE MFGR. Sun Microsystems#. S10FGX-40-32-P46	9,972.15	29,916.45
002	3	EA	X3540F SPARCSYSTEM 10 COUNTRY KIT SPARCSYSTEM 10 TYPE 5 COUNTRY KIT TYPE 5 COUNTRY KIT FOR U.S. AND CANADA ONLY UNIX MFGR. Sun Microsystems#. X3540F.....	-0-	-0-
003	3	EA	X987A AUDIO/AUI ADAPTER CABLE MFGR. Sun Microsystems#. X987A.....	42.75	128.25
004	3	EA	X545A 1.05 GBYTE FAST SCSI-2 DESKTOP DISK PACK MFGR. Sun Microsystems#. X545A.....	912.00	2,736.00
005	2	EA	X116F 16-MBYTE MEMORY EXPANSION (16-MBYTE SIMM) MFGR. Sun Microsystems#. X116F.....	584.25	1,168.50

WE OFFER TO SELL TO YOU THE ABOVE MATERIAL(S) OR SERVICE  
AT THE PRICE AND TERMS SPECIFIED HEREON, AND IN ACCORD-  
ANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED.

ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY HAVE BEEN  
CLEARLY INDICATED.

IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR  
QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELE-  
PHONE NUMBER SHOWN ABOVE.

**THIS IS NOT  
AN ORDER**

BID SUBMITTED BY: DATE 1/31/94

FIRM NAME Sun Microsystems, Inc.

SIGNED

TITLE Sales Representative

TELEPHONE NUMBER 615/966-8528

TOLL-FREE TEL. NO.

# THE UNIVERSITY OF TENNESSEE

PAGE 2

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24719N Bidder

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
006	7	EA	4/30FGX-16-P44 SPARCSYSTEM LX GX 8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION 16-INCH COLOR MONITOR, 16-MBYTE, 535-MBYTE INTERNAL SCSI-2 DISK MFGR. Sun Microsystems#..4/30FGX-16-P44	5,127.15	35,890.05
007	7	EA	X3540R TYPE 5 COUNTRY KIT TYPE 5 COUNTRY KIT FOR U.S. AND CANADA ONLY UNIX MFGR. Sun Microsystems#..X3540R.....	-0-	-0-
008	1	EA	X557A DESKTOP SUNCD PLUS PACK MFGR. Sun Microsystems#..X557A.....	510.15	510.15
009	1	EA	X660A 150-MBYTE 1/4-INCH TAPE DESKTOP BACKUP PACK MFGR. Sun Microsystems#..X660A.....	969.00	969.00
010	1	EA	X814A 5-GBYTE 8MM TAPE BACKUP DRIVE DESKTOP STORAGE MODULE MFGR. Sun Microsystems#..X814A.....	2,508.00	2,508.00
011	1	EA	SX-21 SOLARIS 1.1.1 MEDIA FOR NEW SYSTEMS ONLY SOLARIS SOFTWARE (MEDIA ONLY)- FOR USE WORLDWIDE CD-ROM FOR: ALL SPARCSYSTEMS (EXCEPT SPARCCCLASSIC AND	114.00	114.00

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FIRM NAME \_\_\_\_\_

SIGNED \_\_\_\_\_

TITLE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_

TOLL-FREE TEL. NO. \_\_\_\_\_



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FIRM NAME \_\_\_\_\_

SIGNED \_\_\_\_\_

TITLE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_

TOLL-FREE TEL. NO. \_\_\_\_\_

**THIS IS NOT  
AN ORDER**



**sun**  
microsystems

# Sales Quotation

Quote Number: **4146-A**

Quote Date: **Jan 28 1994**  
[Quote Valid For 60 Days]

To: R. C. Bolling  
University Of TN  
Purchasing Department  
2200 Andy Holt Avenue  
Knoxville, TN 37996  
Ph/Fax: 974-3311 /

From: Thomas Rittenberry  
Knoxville, TN, Sales Office  
725 Pellissippi Parkway  
Suite 205  
Knoxville, TN 37922  
Ph/Fax: (615) 966-8528 / (615) 675-1380

We are pleased to quote as follows:

Reference
EC-E00121

Credit Terms
Net 30 Days

F.O.B.
Destination / Point of Embarcation

Page
1 of 3

Approved By :

Item	Product Number	Description	Qty	Unit List Price	Disc	Unit Net Price	Extended Net Price (US \$)
1	S10FGX-40-32-P46	SPARCsystem 10 Model 40 with One SuperSPARC Processor GX 8-bit Accelerated 2-D/3-D Color Graphics Workstation 16-inch Color Monitor, 32-Mbyte, 1.05-Gbyte Internal Fast SCSI-2 Disk, Speakerbox, 1.44-Mbyte 3.5-inch Internal Floppy Drive	3	17,495.00	43.000	9,972.15	29,916.45
2	X3540F	SPARCsystem 10 Country Kit SPARCsystem 10 Type 5 Country Kit Type 5 Country Kit for U.S. and Canada Only UNIX	3	0		0	0
3	X987A	Audio/AUI Adapter Cable	3	75.00	43.000	42.75	128.25
4	X545A	1.05-Gbyte Fast SCSI-2 Desktop Disk Pack	3	1,600.00	43.000	912.00	2,736.00
5	X116F	16-Mbyte Memory Expansion (16-Mbyte SIMM)	2	1,025.00	43.000	584.25	1,168.50

Expected Shipment: 15-20 Days After Receipt Of Order.

Please read this quotation carefully. The terms set forth on the last page of this form constitute the entire agreement between the seller and buyer. Seller will not be bound by any terms of buyer's order that are inconsistent with the terms herein. Acceptance by buyer of these terms may be made either [1] by written acceptance or [2] by receipt by buyer of delivery of any goods described on the face of this form and failure by buyer to return the goods within five days following such delivery.

This quotation shall remain firm for the period listed above unless modified by SUN MICROSYSTEMS, INC. prior to our acceptance of your order. This quotation and any order placed as a result hereof shall be subject exclusively to the Terms and Conditions hereon and execution of the attached agreements. Any contract resulting from this quotation must be signed in Mountain View, CA by a duly authorized representative of SUN MICROSYSTEMS, INC. Any additions, modifications or waivers of any of the Terms and Conditions contained herein or on the attached Agreements shall only be effective if in writing and agreed to by an authorized representative of SUN MICROSYSTEMS, INC. SUN MICROSYSTEMS, INC. disclaims all implied warranties, including all warranties of merchantability and all warranties of fitness for a particular purpose. SUN MICROSYSTEMS, INC. shall not be liable for incidental, special, or consequential damages arising from any cause.

Accepted By: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

Note: Not valid unless accompanied by a hardcopy Purchase Order.



**sun**  
microsystems

## Sales Quotation

Quote Number: **4146-A**

Quote Date: **Jan 28 1994**  
(Quote Valid For 60 Days)

Page

2 of 3

Item	Product Number	Description	Qty	Unit List Price	Disc	Unit Net Price	Extended Net Price (US \$)
6	4/30FGX-16-P44	SPARCsystem LX GX 8-bit Accelerated 2-D/3-D Color Graphics Workstation 16-inch Color Monitor, 16-Mbyte, 535-Mbyte Internal SCSI-2 Disk	7	8,995.00	43.000	5,127.15	35,890.05
7	X3540R	Type 5 Country Kit Type 5 Country Kit for U.S. and Canada Only UNIX	7	0		0	0
8	X557A	Desktop SunCD Plus Pack	1	895.00	43.000	510.15	510.15
9	X660A	150-Mbyte 1/4-inch Tape Desktop Backup Pack	1	1,700.00	43.000	969.00	969.00
10	X814A	5-Gbyte 8mm Tape Backup Drive Desktop Storage Module	1	4,400.00	43.000	2,508.00	2,508.00
11	SX-21	Solaris 1.1.1 Media for New Systems Only Solaris Software (Media Only) - For Use Worldwide CD-ROM for: All SPARCsystems (except SPARCclassic and SPARCstation LX)	1	200.00	43.000	114.00	114.00
12	SS-23	Solaris 1.1.1 Answerbook Online Documentation Media, Single-User License, and Documentation CD-ROM: All SPARCsystems	1	495.00	43.000	282.15	282.15
13	SX-09	Solaris 1.1.1 Documentation Full Documentation Set (No Media) SunOS Full Manual Set with Binders	1	1,295.00	43.000	738.15	738.15
14	FOB DEST		1	750.00		750.00	750.00

Accepted By: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

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**Sun**  
microsystems

# Sales Quotation

Quote Number: **4146-A**

Quote Date: **Jan 28 1994**  
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Page

3 of 3

Item	Product Number	Description	Qty	Unit List Price	Disc	Unit Net Price	Extended Net Price (US \$)
		Quote Total:					75,710.70

Accepted By: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_

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## THE UNIVERSITY OF TENNESSEE

PURCHASING DEPARTMENT  
2200. ANDY HOLT AVENUE  
KNOXVILLE TN  
615-974-3311

37996 5000

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BUYER R. C. BOLLING

**THIS  
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ORDER**

Bidder

ATLANTIC MICROSYSTEMS INC  
585 GROVE ST, SUITE 140  
HERNDON VA 22070

74461N

Bidder

PLEASE

INSERT

SHIPMENT  
PROMISED

TERMS

F.O.B.

UTK-DEST

30 days ARO  
1% 10net 30

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
001	3	EA	ITEMS AS LISTED BELOW TO BE SUN PER THE ATTACHED SPECIFICATIONS OR EQUAL. S10FGX-40-32-P46 SPARCSYSTEM 10 MODEL 40 WITH ONE SUPERSPARC PROCESSOR GX 8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION 16-INCH COLOR MONITOR, 32-MBYTE 1.05-GBYTE INTERNAL FAST SCSI-2 DISK, SPEAKERBOX, 1.44-MBYTE 3.5-INCH INTERNAL FLOPPY DRIVE MFGR. <u>AXIL</u> .....# <u>4.0</u> .....	10,116.96	30,350.88
002	3	EA	X3540F SPARCSYSTEM 10 COUNTRY KIT SPARCSYSTEM 10 TYPE 5 COUNTRY KIT TYPE 5 COUNTRY KIT FOR U.S. AND CANADA ONLY UNIX MFGR.....#.....	NO	CHARGE
003	3	EA	X987A AUDIO/AUI ADAPTER CABLE MFGR.....#.....	NO	CHARGE
004	3	EA	X545A 1.05 GBYTE FAST SCSI-2 DESKTOP DISK PACK MFGR. <u>SEAGATE</u> .....# <u>ST.31200N</u> .....	948.64	2,845.92
005	2	EA	X116F 16-MBYTE MEMORY EXPANSION (16-MBYTE SIMM) MFGR. <u>AXIL</u> .....#.....	745.36	1,490.72

WE OFFER TO SELL TO YOU THE ABOVE MATERIAL(S) OR SERVICE AT THE PRICE AND TERMS SPECIFIED HEREON, AND IN ACCORDANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED.

ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY HAVE BEEN CLEARLY INDICATED.

IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELEPHONE NUMBER SHOWN ABOVE.

**THIS IS NOT  
AN ORDER**BID SUBMITTED BY: DATE 2-4-94FIRM NAME ATLANTIC MICROSIGNED Susan J. JonesTITLE DIR. OF MKTG + SALESTELEPHONE NUMBER 703-478-2764

TOLL-FREE TEL NO.

# THE UNIVERSITY OF TENNESSEE

PAGE 2

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74461N Bidder

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UTK-DEST

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1% 10 net 30

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
006	7	EA	4/30FGX-16-P44 SPARCSYSTEM LX GX 8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION 16-INCH COLOR MONITOR, 16-MBYTE, 535-MBYTE INTERNAL SCSI-2 DISK MFGR AXIL.....#professional +	5,640.56	39,693.92
007	7	EA	X3540R TYPE 5 COUNTRY KIT TYPE 5 COUNTRY KIT FOR U.S. AND CANADA ONLY UNIX MFGR.....#.....	NO	CHARGE
008	1	EA	X557A DESKTOP SUNCD PLUS PACK MFGR TEXEL.....#5024.....	432.32	432.32
009	1	EA	X660A 150-MBYTE 1/4-INCH TAPE DESKTOP BACKUP PACK MFGR.....#.....	498.40	498.40
010	1	EA	X814A 5-GBYTE 8MM TAPE BACKUP DRIVE DESKTOP STORAGE MODULE MFGR.....#.....	2,296.00	2,296.00
011	1	EA	SX-21 SOLARIS 1.1.1 MEDIA FOR NEW SYSTEMS ONLY SOLARIS SOFTWARE (MEDIA ONLY) - FOR USE WORLDWIDE CD-ROM FOR: ALL SPARCSYSTEMS (EXCEPT SPARCCCLASSIC AND	NO	CHARGE

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BID SUBMITTED BY: DATE 2-4-94

FIRM NAME ATLANTIC MICRO

SIGNED Susan Hennes

TITLE Dir of Mktg & Sales

TELEPHONE NUMBER 703-478-2764

TOLL-FREE TEL NO.

# THE UNIVERSITY OF TENNESSEE

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
012	1	EA	SPARCSTATION LX) MFGR.....#..... SS-23 SOLARIS 1.1.1 ANSWERBOOK ONLINE DOCUMENTATION MEDIA, SINGLE-USER LICENSE AND DOCUMENTATION CD-ROM: ALL SPARCSYSTEMS MFGR.....#.....	448.00	448.00
013	1	EA	SX-09 SOLARIS 1.1.1 DOCUMENTATION FULL DOCUMENTATION SET (NO MEDIA) SUNOS FULL MANUAL SET WITH BINDERS MFGR.....#..... WARRANTY..... N.B. PLEASE SEND CURRENT PRICE LIST AND DESCRIPTIVE LITERATURE WITH YOUR BID.  IF THE BIDDER TAKES EXCEPTION TO ANY- THING IN THE SPECIFICATIONS THE EX- CEPTIONS MUST BE LISTED BELOW. IF NECESSARY SUPPLEMENT THIS FORM AND SO INDICATE BELOW. IF NO EXCEPTIONS ARE TAKEN, WRITE "NONE". .....NONE..... ..... ..... .....	924.00	924.00
TOTAL:					78,980.16

WE OFFER TO SELL TO YOU THE ABOVE MATERIAL(S) OR SERVICE  
AT THE PRICE AND TERMS SPECIFIED HEREON, AND IN ACCORD-  
ANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED.

ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY HAVE BEEN  
CLEARLY INDICATED.

IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR  
QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELE-  
PHONE NUMBER SHOWN ABOVE.

**THIS IS NOT  
AN ORDER**

BID SUBMITTED BY: DATE 2-4-94

FIRM NAME ATLANTIC MICRO

SIGNED Susan Torres

TITLE Dir. of MKTG + SALES

TELEPHONE NUMBER 703-478-2964

TOLL-FREE TEL NO.

# THE UNIVERSITY OF TENNESSEE

PAGE 1

PURCHASING DEPARTMENT  
2200 ANDY HOLT AVENUE  
KNOXVILLE TN 37996 5000  
615-974-3311

REQUEST FOR QUOTATION

NUMBER EC-E00121

DATE 01/24/94

RETURN QUOTATION  
BY DATE SHOWN

DUE DATE 02/09/94 10:45 ET

BUYER R. C. BOLLING

**THIS  
IS  
NOT  
AN  
ORDER**

Bidder

FALCON SYSTEMS INC  
1417 WEST NORTH MARKET  
SACRAMENTO CA 95834  
DARLENE CRAIG

53619N

Bidder

PLEASE

INSERT

SHIPMENT  
PROMISED

3 weeks ARO

TERMS

NET-30

F.O.B.

UTK-DEST

ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
001	3	EA	ITEMS AS LISTED BELOW TO BE SUN PER THE ATTACHED SPECIFICATIONS OR EQUAL. S10FGX-40-32-P46 SPARCSYSTEM 10 MODEL 40 WITH ONE SUPERSPARC PROCESSOR GX 8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION 16-INCH COLOR MONITOR, 32-MBYTE 1.05-GBYTE INTERNAL FAST SCSI-2 DISK, SPEAKERBOX, 1.44-MBYTE 3.5-INCH INTERNAL FLOPPY DRIVE MFGR.....#.....	\$14,726.50	\$44,178.50
002	3	EA	X3540F SPARCSYSTEM 10 COUNTRY KIT SPARCSYSTEM 10 TYPE 5 COUNTRY KIT TYPE 5 COUNTRY KIT FOR U.S. AND CANADA ONLY UNIX MFGR.....#.....		n/chg.
003	3	EA	X987A AUDIO/AUI ADAPTER CABLE MFGR.....#.....	\$75.00	\$225.00
004	3	EA	X545A 1.05 GBYTE FAST SCSI-2 DESKTOP DISK PACK MFGR.....#.....	\$1,000.00	\$3,000.00
005	2	EA	X116F 16-MBYTE MEMORY EXPANSION (16-MBYTE SIMM) MFGR.....#.....	\$750.00	\$1,500.00

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BID SUBMITTED BY:

DATE 2-1-94

FIRM NAME

FALCON SYSTEMS INC

SIGNED

Darlene Craig

TITLE

NAT. ACCT. REP

TELEPHONE NUMBER

TOLL-FREE TEL. NO.

800-326-1002



# THE UNIVERSITY OF TENNESSEE

PAGE 2

PURCHASING DEPARTMENT  
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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
006	7	EA	4/30FGX-16-P44 SPARC SYSTEM LX GX 8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION 16-INCH COLOR MONITOR, 16-MBYTE, 535-MBYTE INTERNAL SCSI-2 DISK MFGR.....#.....	\$7000.-	\$49,000.-
007	7	EA	X3540R TYPE 5 COUNTRY KIT TYPE 5 COUNTRY KIT FOR U.S. AND CANADA ONLY UNIX MFGR.....#.....		no ch.
008	1	EA	X557A DESKTOP SUNCD PLUS PACK MFGR.....#.....	\$800.-	\$800.-
009	1	EA	X660A 150-MBYTE 1/4-INCH TAPE DESKTOP BACKUP PACK MFGR.....#.....	\$585.-	\$585.-
010	1	EA	X814A 5-GBYTE 8MM TAPE BACKUP DRIVE DESKTOP STORAGE MODULE MFGR.....#.....	\$2400.-	\$2,400.-
011	1	EA	SX-21 SOLARIS 1.1.1 MEDIA FOR NEW SYSTEMS ONLY SOLARIS SOFTWARE (MEDIA ONLY) - FOR USE WORLDWIDE CD-ROM FOR: ALL SPARC SYSTEMS (EXCEPT SPARC CLASSIC AND	\$200	\$200

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FIRM NAME FALCON SYSTEMS

SIGNED [Signature]

TITLE

TELEPHONE NUMBER

TOLL-FREE TEL NO. 800-326-1002

# THE UNIVERSITY OF TENNESSEE

PAGE 3

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53619N Bidder

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
012	1	EA	SPARCSTATION LX) MFGR.....#..... SS-23 SOLARIS 1.1.1 ANSWERBOOK ONLINE DOCUMENTATION MEDIA, SINGLE-USER LICENSE AND DOCUMENTATION CD-ROM: ALL SPARCSYSTEMS	\$ 495.-	\$495.-
013	1	EA	MFGR...SUN#...SS-23 SX-09 SOLARIS 1.1.1 DOCUMENTATION FULL DOCUMENTATION SET (NO MEDIA) SUNOS FULL MANUAL SET WITH BINDERS MFGR...SUN#...SX-09 WARRANTY.....1 year N.B. PLEASE SEND CURRENT PRICE LIST AND DESCRIPTIVE LITERATURE WITH YOUR BID.  IF THE BIDDER TAKES EXCEPTION TO ANY- THING IN THE SPECIFICATIONS THE EX- CEPTIONS MUST BE LISTED BELOW. IF NECESSARY SUPPLEMENT THIS FORM AND SO INDICATE BELOW. IF NO EXCEPTIONS ARE TAKEN, WRITE "NONE". none	\$ 1295.-	\$1,295.-

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BID SUBMITTED BY: DATE 2-1-94

FIRM NAME FALCON SYSTEMS INC.

SIGNED [Signature]

TITLE NAT ACCT. REP

TELEPHONE NUMBER

TOLL-FREE TEL NO. 800-326-1002

# THE UNIVERSITY OF TENNESSEE

PAGE 4

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ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
			<p>CERTIFICATION:</p> <p>PLEASE INDICATE BELOW ONLY IF YOUR FIRM IS:</p> <p>.....<input checked="" type="checkbox"/> SMALL</p> <p>.....SMALL/DISADVANTAGED (MINORITY)</p> <p>.....WOMAN OWNED</p> <p>IT IS UNDERSTOOD AND AGREED THAT THIS BID, WHEN CERTIFIED BY AN AUTHORIZED SIGNATURE, SHALL CONSTITUTE AN OFFER, WHICH WHEN ACCEPTED IN WRITING BY THE DEPARTMENT OF BUSINESS SERVICES, PURCHASING DIVISION, AND SUBJECT TO THE TERMS AND CONDITIONS OF SUCH ACCEPTANCE, WILL CONSTITUTE A VALID AND BINDING CONTRACT BETWEEN THE UNIVERSITY OF TENNESSEE AND THE VENDOR/CONTRACTOR (BIDDER) SUBMITTING SUCH OFFERING.</p> <p>ATTACHMENTS:</p> <p>1. GENERAL BID CONDITIONS</p> <p>2. SPECIAL BID CONDITIONS 10</p> <p>3. SPECIFICATIONS- 2 PAGE(S)</p> <p>THE SUCCESSFUL BIDDER WILL BE REQUIRED TO CONFORM TO ALL PARKING REGULATIONS WHILE VEHICLES OF THE SUCCESSFUL BIDDER ARE ON THE UNIVERSITY OF TENNESSEE CAMPUS.</p> <p>1. A VENDOR PARKING PERMIT WILL BE REQUIRED IF VEHICLES ARE TO BE PARKED ON UNIVERSITY GROUNDS, STREETS OR PARKING LOTS. PERMITS ARE AVAILABLE FROM THE UNIVERSITY TRAFFIC OFFICE AT 1411 WHITE AVENUE FOR A COST OF \$3.00 PER DAY PER VEHICLE OR \$72.00 PER YEAR PER VEHICLE. THESE COSTS ARE SUBJECT TO CHANGE.</p> <p>2. ALL VENDOR VEHICLES ARE SUBJECT</p>		

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**THIS IS NOT  
AN ORDER**

BID SUBMITTED BY: DATE

FIRM NAME Falcon Systems

SIGNED [Signature]

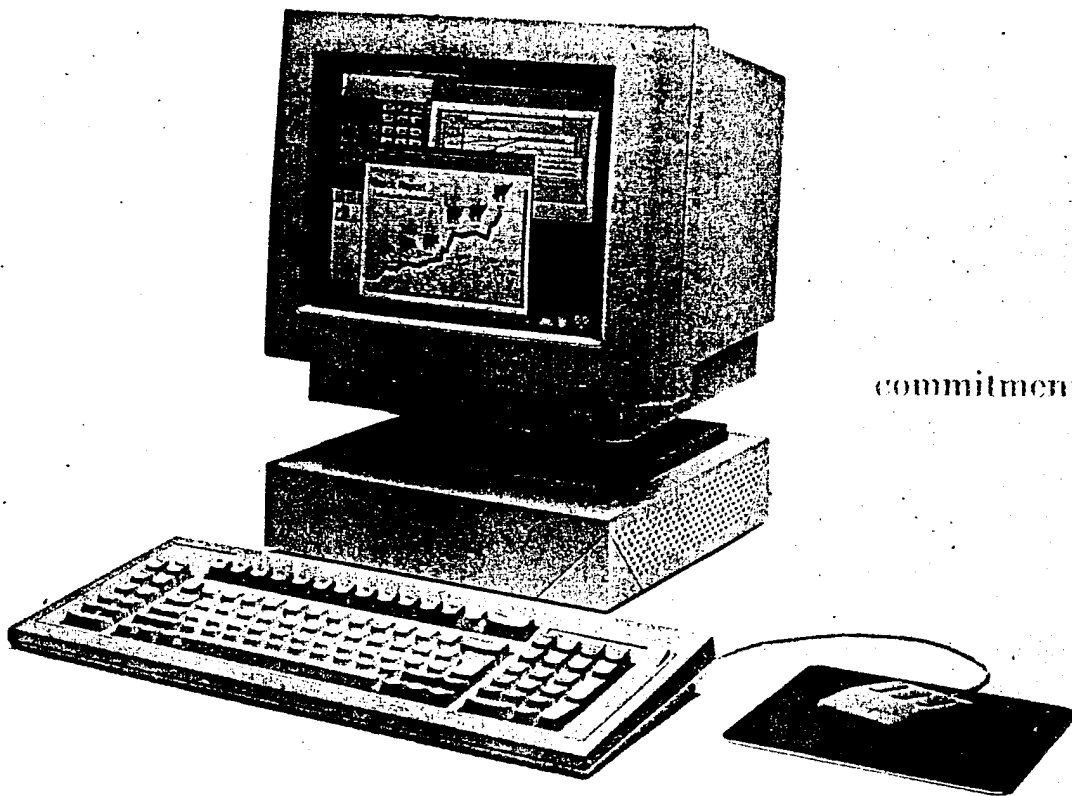
TITLE

TELEPHONE NUMBER

TOLL-FREE TEL NO.

**Axil**  
WORKSTATIONS

performance



commitment

innovation

# Axil-220

The Axil-220 workstation family provides unmatched MicroSPARC™ price/performance and configuration flexibility. The Axil-220™ includes a variety of configurations as well as systems identical to the SPARCstation™ LX and SPARCclassic™.

# Axil-220

The Axil-220 workstation family provides unmatched MicroSPARC™ price/performance and configuration flexibility. The Axil-220 includes a variety of configurations as well as systems identical to the SPARCstation™ LX and SPARCclassic™. For example, one option provides Fax/Modem, which allows immediate send and receive communications with any Group III/IV facsimile machine. Also two internal hard disk drives can be configured, saving space. Designed and built in the U.S.A., the Axil-220 workstations are guaranteed 100% SPARC® compliant, so all Solaris®-based programs run without modification and Axil-220 Workstations integrate seamlessly into SPARC networks. In addition to supporting releases of Solaris 2.X, Solaris 1.1 is also available. Unlike other MicroSPARC-based systems which provide only a maximum of 96 MB of main memory, the Axil-220 supports a maximum of 128 MB of main memory for the more demanding engineering or database applications. The Axil-220 provides the most flexible, cost-effective MicroSPARC solutions available in the market today.

## System Specifications Guaranteed 100% SPARC compliant

<b>Processor</b>			
Architecture	SPARC Version 8, Micro-SPARC 50 MHz	Audio (continued)	With GX graphics: 16-bit audio with internal speaker and external microphone. External speaker box supporting 16-bit audio optionally available.
Memory Management	SPARC reference MMU with 64 contexts		
On-Chip Cache	2 KB data, 4 KB instruction		
<b>Performance</b>			
SPECint	26.4	Mass Storage	
SPECfp	21.0	Internal Floppy Disk	Optional 3.5 inch, 720 KB/1.2 MB/1.44 MB, aut eject
MIPS	59.1	Internal Hard Disk	Maximum of two 3.5" low-profile disks (207 MB or 540 MB)
MFLOPS	4.6	Supported External Storage	1.3 GB Disk, 150 MB 1/4 inch Tape Drive, 644 MB CD-ROM Drive (5.25 inch)
<b>System Memory</b>		<b>Supported Software</b>	
Standard	16 MB	Operating Environment	Solaris® 1.1, Solaris 2.X
Maximum	32 MB with 8 MB SIMMS 128 MB with 32 MB SIMMS	Operating System	SunOS™ 4.1.3, SunOS 5.X.
Memory Type	Parity	Windowing System	Open Windows™ Version 3
<b>Standard Interfaces</b>		Languages	C, C++, Pascal, FORTRAN
Ethernet	10Mb/sec twisted pair standard (10-Base T). AUI available with optional adapter cable	Networking	ONC™, ONC+™, NFS®, MHS
SCSI	10 MB/sec SCSI-2	Graphics	TCP/IP, SunNET™ OSI
Serial	Two RS-232C/RS-423 serial ports		SunVision™, SunPHIGS™, XGL™, SunGKS™, Xlib, PostScript®
Parallel	Centronics-compatible parallel port		
SBus	Two expansion slots, 32-bit data path	Display Options	
Audio	With CG3 graphics: 8-bit audio; internal speaker and external microphone.	GX Resolution	Accelerated 8-bit 2-D/3-D wire frame, 1024 x 768 or 1152 x 900 resolution
		CG3	1024 x 768 (SVGA) or 1152 x 900 resolution
		Monitor Support	15, 17 and 20 inch color



For more information, please contact  
Axil Workstations at 800.284.AXIL (within the USA)  
(+1) 512.345.1994 (outside the USA).

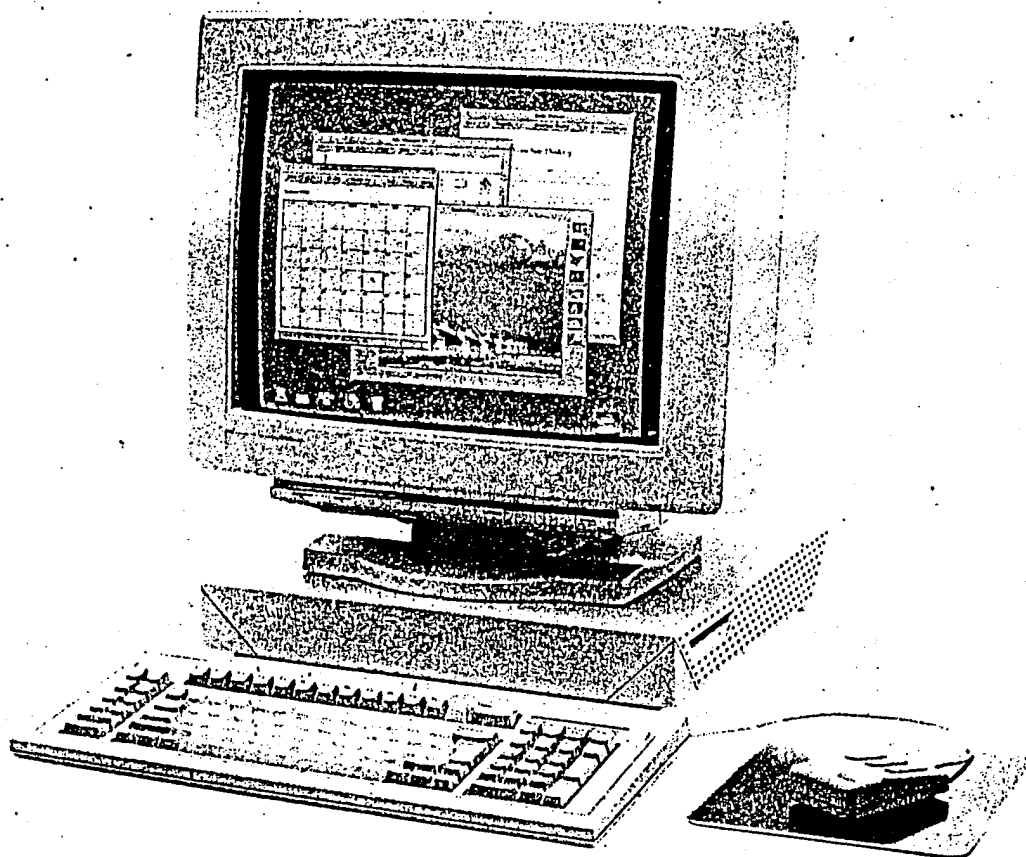
Axil Workstations is a division of Hyundai Electronics America, 166 Baypointe Parkway San Jose, CA 95134  
Telephone 408.894.9700 Facsimile 408.894.8274 Sales 800.284.AXIL (within the USA),  
Sales (+1) 512.345.1994 (outside the USA)

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P/N 4014, Printed in USA 2/93

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**Axil**  
WORKSTATIONS



commitment

# Axil 311 Model 4.0

The Axil-311 Model 4.0 sets the price/performance standard for SPARCstation™ 10 compatibility. Based on SuperSPARC™ MBus technology, the Model 4.0 provides the ideal platform to handle your most demanding applications.

# Axil 311 Model 4.0

The Axil-311 Model 4.0 workstation sets the price/performance standard for SPARCstation™ 10 compatibility. Based on SuperSPARC™ MBus and multimedia technology, the Model 4.0 provides the ideal platform to handle your most demanding business, scientific, and engineering applications. The Model 4.0 can easily be upgraded to multiprocessing capability.\* In addition, the Model 4.0 is designed and built in the U.S.A. and is guaranteed 100% SPARC® compliant so you can integrate it into your SPARC network with confidence. At Axil Workstations, we don't just deliver promises, we deliver performance with productivity.

## System Specifications Guaranteed 100% SPARC compliant

### Processor Module

Architecture	SuperSPARC Version 8
Clock Rate	40 MHz
Cache (on-chip)	36 KB (20 KB instruction, 16 KB data)

### Performance (at 40 MHz)

SPECint 92	50.2
SPECfp 92	60.2
MIPS	109.5
MFLOPS	22.9

### System Memory

Standard	32MB
Maximum	512 MB
Memory Type	ECC
Buswidth	144 bits
SIMM Size	16 MB, 64 MB

### I/O Interfaces

SBus	Four expansion slots, 32-bit width.
Ethernet	10 Mbit/sec built-in 10Base-T (Twisted Pair), separate AUI adapter cable
SCSI	10 MB/sec SCSI-2
ISDN	Dual basic-rate interface (4-wire NT, 4-wire TE)
Serial	Two RS-232C/RS-423 ports
Parallel	Centronics compatible parallel port
Audio	CD quality, stereo 16-bit digital audio (external speakers and microphone included with optional audio kit)

### Mass Storage

Internal Floppy Disk	3.5 inch, 720 KB/1.2 MB/1.44 MB, autoeject
Internal Hard Disk	Maximum of two 3.5 inch disks (540 MB, 1.05 GB or 1.3 GB)
Supported External Storage	1.3 GB Disk, QIC-150 Tape Drive, 644 MB CD-ROM Drive (5.25 inch)

### Supported Input Devices

Keyboard	Sun™ Type 4-5 compatible
Mouse	3-button optical

### Supported Software

Operating Environment	Solaris® 1.1, Solaris 2.X
Operating System	SunOS™ 4.1.3, SunOS 5.X
Windowing System	OpenWindows™ Version 3
Languages	C, C++, Pascal, FORTRAN
Networking	ONC™, ONC+™, NFS™, MHS, TCP/IP, SunNET™ OSI
Graphics	SunVision™, SunPHIGS™, XGL™, SunGKS™, Xlib, PostScript®

### Display Options

GX Resolution	1152(H) x 900(V), 76 Hz refresh rate
GXplus Resolution	1280(H) x 1024(V), 67 Hz refresh rate
CG3, SVGA also supported	
Monitor Support	15, 17 and 19 inch color

\* Solaris 2.X required for multiprocessing.

**Axil**  
WORKSTATIONS



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Sales (+1) 408.894.9700 (outside the USA) Sales 800.284.AXIL (within the USA) Facsimile (+1) 408.894.8274

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P/N 4015 Printed in USA 7/93

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**REMITTANCE ADDRESS**

**ATLANTIC MICROSYSTEMS HAS A  
REMITTANCE ADDRESS TO WHICH  
PAYMENTS SHOULD BE MAILED TO:**

**ATLANTIC MICROSYSTEMS, INC.  
PO BOX 1553  
HERNDON, VA 22070**

**ALL OTHER INFORMATION SHOULD BE  
MAILED TO THE OFFICE ITSELF AT THE  
ADDRESS BELOW.**

**THANK YOU.**



**IF YOU ARE NOT 100% SATISFIED  
WITH THE COMPATIBILITY OF  
AXIL WORKSTATIONS  
WITHIN 90 DAYS,  
AXIL WILL PROVIDE YOU WITH  
A 100% REFUND OF YOUR  
PURCHASE**